

**ABSTRACT OF THE DISCLOSURE**

5        A system and method for monitoring cellular activity in a cellular specimen.  
According to one embodiment, a plurality of excitable markers are applied to the specimen.  
A multi-photon laser microscope is provided to excite a region of the specimen and cause  
fluorescence to be radiated from the region. The radiating fluorescence is processed by a  
spectral analyzer to separate the fluorescence into respective wavelength bands. The  
respective bands of fluorescence are then collected by an array of detectors, with each  
10       detector receiving a corresponding one of the wavelength bands.